201 North Civic Drive
Walnut Creek, California 94596
Tel: (925) 937-9010
Fax: (925) 937-9026
www.brownandcaldwell.com

BROWN AND CALDWELL

January 20, 2004

Mr. Les Grober
Mr. Eric Oppenheimer
Regional Water Quality Control Board Members
Central Valley Region
3443 Routier Road, Suite A
Sacramento, California 95827

25234.301

Subject: Turlock Irrigation District Comments on the Basin Plan Amendment for the Control of Salt and Boron Discharges into the San Joaquin River, and Appendix 1: Technical TMDL Report (November, 2003)

Dear Mr. Grober, Mr. Oppenheimer, and Regional Board Members:

The Turlock Irrigation District (TID) has been working with Regional Board staff since 2001, to understand the technical basis and approach for the Salt and Boron TMDL, and to provide review, feedback, and input. The TID very much appreciates all of the hard work by staff to develop the TMDL, but maintains several major concerns with the current version. The TID also recognizes that salinity presents a significant challenge for the entire San Joaquin River Basin and hopes to continue to work together with the Regional Board to find a workable, comprehensive solution.

To effectively address salinity in the Lower San Joaquin River (LSJR), the Total Maximum Daily Load (TMDL) and Basin Plan Amendment (BPA) must accomplish two important objectives: 1) to comply with salt and boron concentration objectives throughout the segment, and 2) to transport salt out of the basin to avoid a net salt build-up and degradation of ground and surface waters. Unfortunately, as currently drafted, neither objective will be accomplished. In fact, the fixed load TMDL will likely worsen existing salinity problems upstream of Vernalis. The real-time allocation approach, which has been offered as an alternative, is not well defined and has been left to the stakeholders to "make it work." If the real-time approach fails, the fixed load TMDL would have to be implemented, and yet Regional Board staff admit that the "SJR salinity problem is not conducive to establishment solely of inflexible fixed or seasonal monthly load allocations for nonpoint sources" (BPA page 34). Rather than such a costly, complicated and untenable process, the TID proposes a concentration-based approach to the salinity TMDL that will effectively address many of the shortcomings and

concerns of the current approach and will provide a simpler, more equitable, and more certain solution.

Detailed comments are presented below, which augment comments presented previously by the TID (attached November, 2002 letter). As a member of the San Joaquin River Tributary Association, the TID also supports comments submitted separately by that association.

Thank you very much for your consideration.

Very truly yours,

BROWN AND CALDWELL

Cynthia Paulson, Ph.D., P.E.
Vice President

TURLOCK IRRIGATION DISTRICT

Debra C. Liebersbach, P.E.
Senior Civil Engineer

ARCHER NORRIS

Peter W. McGaw, Esq.

CP:tw
Enclosure

cc: Mr. Robert Nees, Turlock Irrigation District

SALT AND BORON TMDL AND BPA (NOVEMBER, 2003 VERSION)
COMMENTS ON BEHALF OF THE TURLOCK IRRIGATION DISTRICT
(1-20-04)

Because of the importance of agriculture to the local economy and the rest of the Central Valley and the implications of the salinity TMDL, the Turlock Irrigation District (TID) has committed considerable time and effort to provide meaningful input over the last two years. The TID staff and consultants from Brown and Caldwell have attended Regional Board workshops, met with Regional Board staff on several occasions, provided detailed comments on the draft TMDL in November 2002 and oral comments at the Regional Board workshop on December 5, 2003, and wrote a paper that has been published in the proceedings of the Water Environment Federation's (WEF's) National TMDL Conference in Chicago in November 2003. The TID's 2002 comment letter and the WEF paper are attached to provide historical context and more detailed discussion of the issues.

Although Regional Board staff has been courteous and willing to discuss the draft TMDL, the TID has not felt that its comments have been fully taken into account. Even early in the process, when the TMDL was in a preliminary draft format, staff did not seem willing to consider alternative approaches offered by the TID. It seemed that staff was set in their direction, even if flawed.

The TID appreciates the Board's responsiveness to comments made at the December 5, 2003 workshop, the recognition that the current version of the TMDL is not ready for approval, and the direction of staff to consider alternative approaches. The TID hopes that staff will give the proposed concentration-based approach the opportunity to work and to affect real water quality improvements.

Default Base Load Allocation TMDL Has Serious Flaws

The TID has several specific concerns with the current version of the Salinity TMDL and particularly with the default fixed load allocation, as summarized below.

Limits Salt Export

Salinity in the San Joaquin River Basin presents a unique water quality problem, in that there are dual and somewhat divergent needs – to maintain sufficiently low concentrations to meet the concentration-based objective, and to transport sufficient quantities of salt out of the basin to maintain a salt balance. Any sustainable solution to the salinity problem will effectively achieve both needs. Regional Board staff has noted that fixed load allocations "would restrict the ability to export salt from the LSJR basin such that there would be a net salt buildup in the watershed and long-term degradation of ground and surface waters" (BPA, pages 2 and 34). Even with this acknowledgment, however, staff has presented fixed load allocations as the default TMDL to solve the problem.

Not an Equitable or Viable Solution

The TMDL is not equitable. Currently, the TMDL requires various categories of discharges to meet very different salinity concentration objectives. Northwest Side and Grassland sub-areas are allowed to discharge flows at virtually any concentration (even in excess of the WQOs), with the currently proposed credit system. Point source dischargers are allowed to release discharges at the water quality objective - 700 and 1000 uS/cm EC for summer and winter seasons, respectively. Non-point source dischargers from East Side are not allowed to release any discharges that exceed a trigger value set at less than half of the in-stream objective (315 uS/cm).

The load allocation for non-point sources (i.e., agriculture) during the majority of the summer irrigation season is zero. This zero allocation directly affects the East Side, but the Northwest Side and Grasslands sub-areas have been given substantial credits that would offset the zero allocation. In contrast, the East Side is given no credits.

The credits to the Northwest Side and Grasslands sub-areas are substantial, totaling half of the salt that they divert in source water from the Lower San Joaquin River and the DMC. The credits appear to be excessive, as they would allow for fully half of the current salt load delivered to the West Side to be returned to the river, and can total 50,000 tons/month or more, greatly exceeding the TMML itself. As noted in the Technical TMDL Report, the "50 percent salt return factor is based on the assumption that there will be a 30 percent return flow with some added salt to account for evapoconcentration and leaching of salt from prior years" (page 1-72). In addition, the TMDL does not include any allowance to revisit and reduce the credits as source water quality for the Northwest Side and Grasslands sub-areas improves with implementation of the TMDL.

The zero load allocation would require East Side agriculture to capture and store all return flows for extended periods of time (up to 5 months) and/or treat before discharging. Capturing and holding discharges of relatively high quality water from the East Side could require significant expenditures, with very limited water quality benefit. Without significant infrastructure modification, implementation of the TMDL would result in re-directed impacts to the eastside areas, including further concentration of salts in the groundwater (from reduced drainage), and surface water (while it is being stored). (Additional discussion on the impacts to East Side agriculture, including the anticipated infrastructure modifications needed should the proposed BPA be adopted, is included later in this document.)

Overly Complex and Difficult to Measure Compliance

The current fixed load TMDL is extremely complex, with 65 different Total Maximum Monthly Loads (TMMLs) to cover several climatic conditions and allocations among 7 sub-areas, to produce a total of 455 TMMLs. As described above, the original TMMLs have also been modified by credits given to the Northwest Side and Grasslands sub-areas, which further confuse the result. Finally, the U.S. Bureau of Reclamation is given a separate allocation, which has no physical meaning and is not included in the TMMLs. The TMMLs are not summarized in a final form anywhere in the TMDL Technical Report, so it is not even clear what values will be applied to measure compliance. The TID

views this level of complexity as untenable in a TMDL, and unnecessary in this case, and has offered an alternative simpler, concentration-based approach (see below).

It will be nearly impossible to measure compliance with the TMDL as it is currently written. The BPA Staff Report suggests several monitoring sites to measure compliance, but it would require significant investment in flow and conductivity monitoring devices at multiple sites within the sub-area and considerable effort to analyze the data to evaluate compliance against allowable monthly loads. It would seem prudent to focus efforts on actions that help to directly improve water quality rather than creating an overly complex system that requires major efforts to administer.

TMDL Appears to be Overly Protective

With the extremely high level of complexity and convoluted nature of the current TMDL, it is very difficult to understand exactly what the outcome might be for water quality and whether the TMDL allocation is over- or under-protective. On repeated occasions, the TID has reviewed the details of the fixed load allocation TMDL carefully with Regional Board staff, and through this process, it appears that the TMDL continues to evolve as staff are still learning more about the ramifications of the fixed load allocation. This is also a good indication of the implications of an overly complex TMDL – it is very difficult to understand the implications.

For instance, the TID presented bar charts of the TMML allocations for two different flow conditions at the December 5, 2003, Regional Board workshop, using information presented in several tables in the TMDL Technical Report (i.e., Tables 4-12, 4-19, 4-22, and 4-23). At that time, the charts seemed to validate the conclusions of the BPA Staff Report that the TMDL would actually be **under-protective** and would not meet water quality objectives under critical low flow conditions (see "expected salinity WQO exceedance rates" shown in Figure 4-1, page 79).

However, after a detailed review of the plots by Regional Board staff, they have suggested two important adjustments: 1) to account for the losses associated with diversions from the Lower San Joaquin River, and 2) to remove the USBR allocation, because it has no physical significance and was used only to determine the USBR responsibility. The new calculations, which are detailed below and have been confirmed by Regional Board staff, indicate a vastly different conclusion from the BPA Staff Report – that the TMMLs are greatly under-allocated or **over-protective**. The TMMLs already include a significant margin of safety, given that they are based on the lowest flow on record for each flow condition. In other words, when actual implications for water quality are considered in detail, it appears that Regional Board staff seems to have greatly "overshot" the goal of achieving the water quality objectives and is imposing extreme restrictions on East Side nonpoint sources without cause.

As shown in the two examples presented below, the net TMML allocations are far below the allowable TMML, which leaves considerable salt load that could be re-allocated among other dischargers (e.g., nonpoint sources). In the August critical low flow condition, the net allocation, or difference between the allowable TMML and allocation, is actually negative (implying a negative salt load). This would leave approximately 34.5 thousand tons/month of excess allocation that could be distributed among other sources. In the June above normal flow condition, the under-allocated load totals 20.8 thousand tons/month.

In recent conversations, Regional Board staff has indicated that the USBR may not be required to achieve reductions fully equal to their responsibility, now that it has become clear that the TMMLs are quite over-protective. However, for some unknown reason, staff has not been open to re-considering the allocation to give some of the available load to nonpoint sources. So, the load allocation remains at zero, even though there is considerable load available, which is inequitable for East Side agriculture.

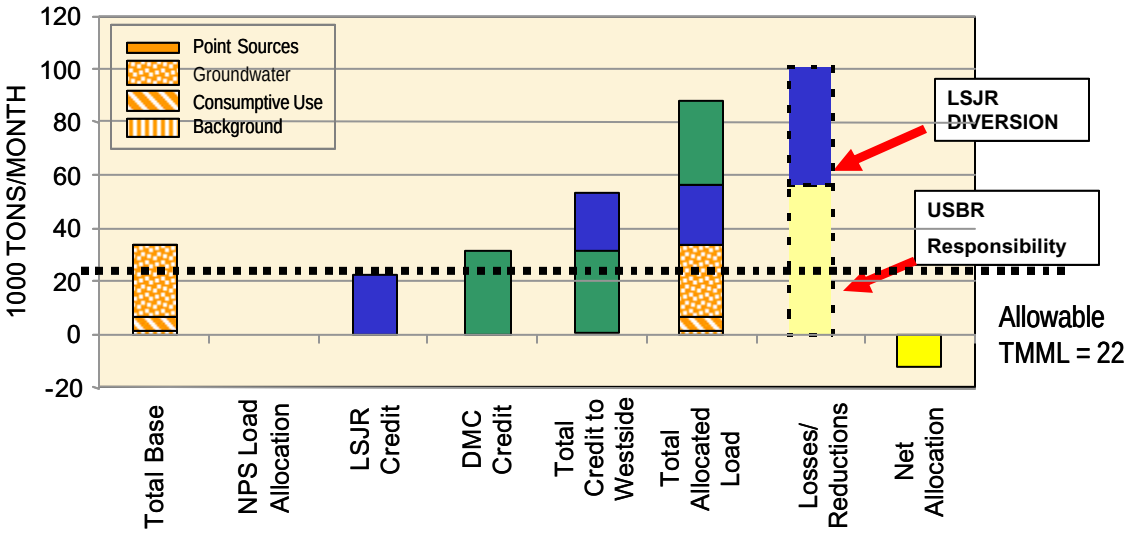
In further conversations with Regional Board staff, it appears that the reason for the discrepancy between conclusions drawn from the Technical TMDL Report and BPA Staff Report is that the modeling performed for the BPA did not account for any salinity reductions associated with the USBR responsibility, reportedly because of technical complications. It is not appropriate and is extremely misleading to ignore USBR salinity reduction responsibilities in the BPA Staff Report assessment. The result is a greatly over-protective TMDL.

The examples presented below illustrate the over-protective and inequitable nature of the TMDL.

August critical low flow condition. As shown in Figure 2 (in units of thousand tons/month), the total allocated load (88.2) is offset by losses with the diversion of flow and associated salt from the Lower San Joaquin River (44.6) and reductions that are the responsibility of the USBR (56.1). The resulting net allocation is negative (-12.5), and well below the TMML at Vernalis (22). For the August critical low flow condition, the allocation overshoots the TMML considerably (34.5), and is greatly over-protective. The detailed calculations are reviewed below.

In the TMML allocation process, Regional Board staff has assumed that several types of sources, including background, groundwater, consumptive use, and point sources are always present, creating a “baseline condition”. Groundwater alone (27) and the baseline sources taken together (34.1) exceed the allowable TMML (22). Credits are provided to the Northwest Side and Grassland sub-areas for poor source water quality from the DMC (31.8) and Lower San Joaquin River (22.3), allowing for a considerable discharge of salt from the West Side (54.1). The USBR is given a salinity mitigation responsibility (56.1) that is set equal to the difference between existing USBR source water loads (approximated by two times the DMC credit or 63.6) and the USBR allocation (7.5). As noted in the Technical TMDL Report, “the USBR’s responsibility for excess loads could be reduced or eliminated by improving supply water quality or through mitigation anywhere in the LSJR basin” (page 1-79 of Appendix 1). Non-point sources on the East Side are the only source category not given any allocation or credit.

Figure 2. Allocation for August critical low flow condition



Calculations used to create Figure 2 are as follows *(units in thousand tons/month)*:

TMML for August Critical Low Flow Condition = 22

Allocation Components

Baseline = Background + Consumptive Use + Groundwater + Point Sources
= 1.8 + 4.8 + 27 + 0.5 = 34.1

Other Allocations: USBR = 7.5 *Load Allocation (Non-point Sources) = 0*

Credits to West Side: DMC = 31.8 *LSJR = 22.3*

Total Allocated = Baseline + DMC + LSJR = 34.1 + 31.8 + 22.3 = 88.2

Losses/Reductions:

LSJR Diversion = 44.6

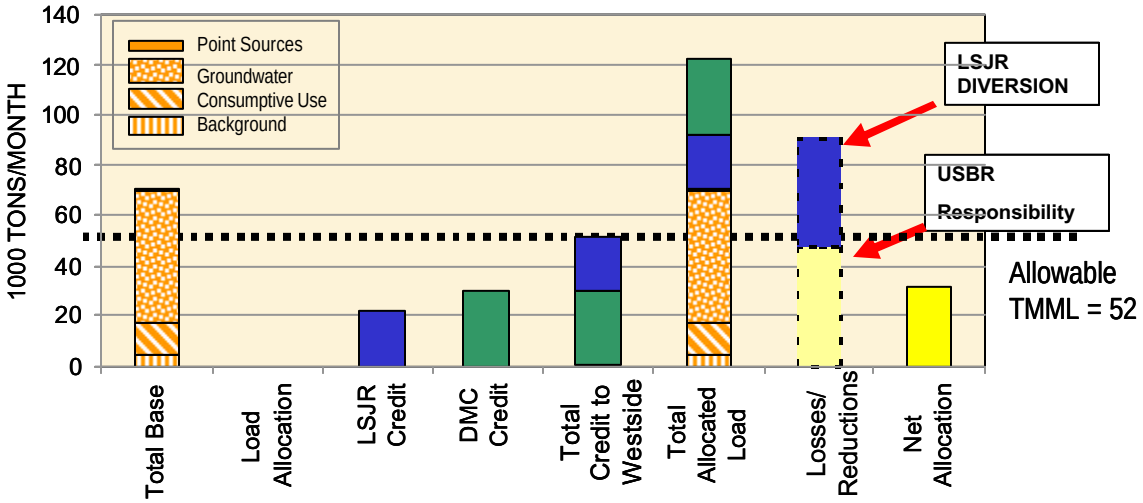
USBR Mitigation Responsibility = (2)DMC – USBR = (2)31.8 – 7.5 = 56.1

Net Allocation *= 88.2 – 44.6 – 56.1 = -12.5*

Unallocated Load = TMML – net allocation = 22 - (-12.5) = 34.5

June above normal flow condition. Similarly, Figure 3 shows that the June above normal flow condition is also over-protective. The allocated load (122.2) is offset by losses with the diversion of flow and associated salt from the Lower San Joaquin River (43.6) and reductions that are the responsibility of the USBR (47.4). The resulting net allocation (31.2) is well below the TMML at Vernalis (52) and overshoots the TMML considerably (20.8), again resulting in a greatly over-protective condition.

Figure 3. Allocation for June above normal flow condition



Calculations used to create Figure 3 are as follows *(units in thousand tons/month)*:

TMML *for June Above Normal Flow Conditions = 52*

Allocation Components

Baseline = Background + Groundwater + Consumptive Use + Point Sources
= 4.6 + 12.4 +53 + 0.5 = 70.5

Other Allocations: *USBR = 12.4* *Non-point Sources = 0*

Credits to West Side: *DMC = 29.9* *LSJR = 21.8*

Total Allocated = Baseline + DMC + LSJR = 70.5 + 29.9 + 21.8 = 122.2

Losses/Reductions:

LSJR Diversion = 43.6

USBR Mitigation Responsibility = (2)DMC – USBR = (2)29.9 – 12.4 = 47.4

Net Allocation *= 122.2 – 43.6 - 47.4 = 31.2*

Unallocated Load = TMML – net allocation = 52 – 31.2 = 20.8

Implications. The water quality implications of the TMDL and BPA, which are revealed through the detailed examples above, raise several important questions. First, are the greatly over-protective TMMLs justified? Are the zero load allocations, which primarily affect East Side agriculture, justified? What other adverse implications for the overall salt balance are associated with requiring East Side agriculture to hold water for several months at a time to meet the objectives? In other words, will the current concentration objectives allow sufficient salt export to maintain a sustainable salt balance in the valley, or will they contribute to a net salt build-up? If groundwater alone exceeds the TMML, shouldn't reductions in groundwater salinity also be considered? Given the confusion over the overly complex TMDL approach, should a substantially different way of accomplishing the TMDL should be considered (e.g., focus on salinity concentrations versus loadings)?

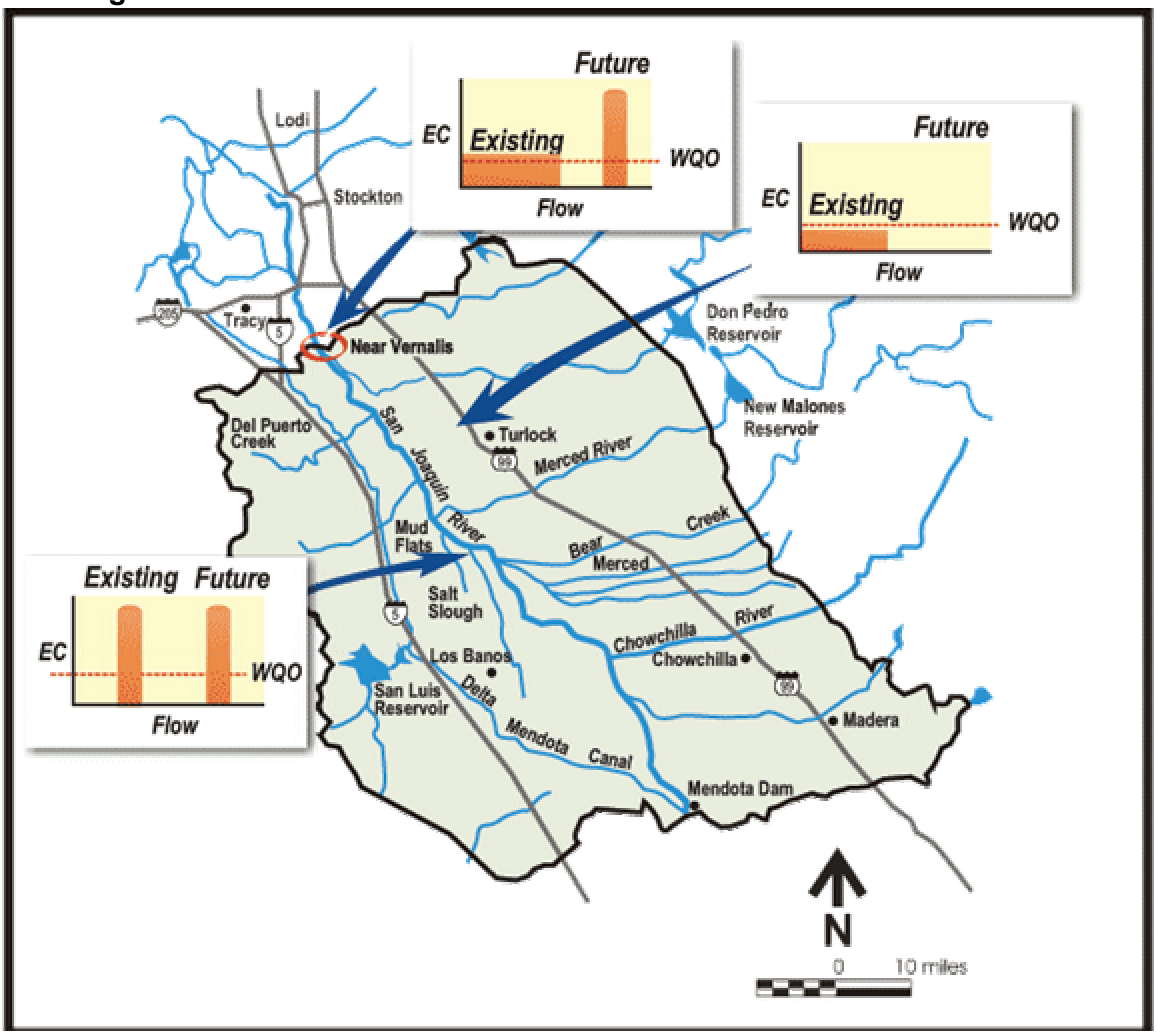
Produces Unintended Adverse Consequences

Allowing zero allocation for non-point sources from the East Side eliminates higher quality, lower concentration discharges that have historically diluted higher concentration

discharges of salts from other sources. In effect, by removing the lower concentration discharges from the East Side while continuing to allow higher concentration discharges from the Northwest Side and Grassland sub-areas, the TMDL may lead to the unintended adverse consequence of reducing the overall salt load in the stream, but increasing the concentration. A very simplified illustration of this effect is presented in Figure 1. More detailed example calculations underlying this illustration are presented in the WEF paper (attached).

Although the example is oversimplified, while it does not reflect the effects of other dilution flows, the point it demonstrates is still valid – the TMDL could reduce overall loads but actually increase downstream concentrations. As shown in Figure 1, current water quality conditions can exceed the objective at Vernalis. The existing salt load is made up of many sources, including West Side discharges, which can be as much as three times higher in concentration than East Side discharges. If the current fixed load TMDL were implemented and discharges from the East Side were no longer allowed, then the result would essentially be a loss of higher quality flows with a relatively small reduction in load, which could lead to an increase in overall salt concentrations. By focusing on salt loads rather than concentrations, the current version of the TMDL could, in fact, result in lower flows and loads, but higher concentrations.

Figure 1. Simplified illustration of the effect of removing higher quality East Side discharges



Will Not Meet Future Salinity Objectives

The proposed TMDL is short-sighted, and it does not provide for future salinity objectives upstream of Vernalis. The 1995 Bay Delta Plan and Water Right Decision 1641 require the Regional Board to "promptly" develop and apply objectives to the San Joaquin River at locations upstream of Vernalis. Many presenters at the December 5, 2003, Regional Board workshop, representing a range of environmental, South Delta, and East Side perspectives, echoed this concern and suggested that it only makes sense to address the problem comprehensively in the current TMDL process. The TID strongly encourages the Regional Board to incorporate upstream objectives into the TMDL process now, rather than starting over again once the new objectives are finalized.

Because the TMDL is currently built entirely around the aim of meeting targeted loads (TMMLs) at Vernalis and because it allows for a blending of discharges of widely varying salinity concentrations, it is unlikely that concentration objectives could be met at upstream locations. The current TMDL approach could actually worsen salinity problems upstream of Vernalis, while it allows for continued high concentration discharges from the Northwest and Grasslands sub-areas, through a credit system, and it prohibits higher quality, lower concentration discharges from the East Side.

Contrary to the Watershed Policy

In Appendix 3 of the BPA, there is a reference to the Watershed Policy, which "calls for focusing efforts on the most important problems and those sources contributing most significantly to those problems". The fixed load allocation would allow the West Side to continue discharging high salinity waters and, at the same time, would not allow the East Side to discharge relatively high quality water if it exceeds the 315 uS/cm EC trigger value. This approach seems to violate the Watershed Policy.

Given all of the flaws in the proposed fixed load allocation, it is not appropriate to apply it as the default technical TMDL approach for the BPA. The solution must be workable and must demonstrate reasonable assurance of success in meeting water quality objectives.

Real-time Allocation Not a Viable Fallback

As the Regional Board staff recognizes, a real-time allocation approach "will require development of significant structural and organizational infrastructure." ("Buff Sheet", Item 19, page 2) The Technical TMDL Report (Appendix 1 to the BPA Staff Report) promises that "guidance for a real-time management framework will be included in the implementation plan for this TMML" (page 1-81). However, no guidance has been provided in either the BPA Staff Report or in any other subsequent document. Out of nearly 100 pages, the Technical TMDL Report dedicates only one page to explain the real-time allocation and little more detail is included within the Program of Implementation under the BPA. So, dischargers are left "holding the bag", being held responsible to create a real-time management program on their own and to provide the required notice of intent to participate within a short one-year time frame. As it is, the real-time allocation approach is so ill-defined that it is difficult to determine whether or

how it might work. Given what is currently known, there are several concerns with the real-time approach, as described below.

Complex, Difficult and Costly to Implement

Though simple in theory, real-time allocation would be very complex in practice, even more complex than the fixed load allocation with its 455 TMMLs. A real-time approach would require real-time application of a detailed, multi-input model to predict downstream flows and salt concentrations and to determine in advance the appropriate TMMLs for each upcoming month. Another model would be required to translate the TMMLs into allowable loads for individual points of discharge and associated sources. The real-time approach would also require an extensive institutional and physical infrastructure capable of managing flows and salt discharges (allocating, effectively communicating, and implementing allowable loads) for over 30 public water agencies with jurisdiction in the area and over 9,000 individual farms (BPA Staff Report, page 39) on a real-time basis. The costs to administer this program would be significant, and there is no indication how these long-term operational costs would be addressed. Again, rather than expending major resources to administer the program, it seems better to focus more directly on addressing the problem and improving water quality.

Retains Many Underlying Problems

The real-time approach also suffers from several of the shortcomings noted above in the discussion on the fixed load approach. These concerns include inequities with varying concentration objectives and a credit system that applies only to the West Side, and the inability to meet future objectives upstream of Vernalis.

Does Not Maximize Salt Export

The real-time approach, though designed to increase net salt transport by allowing for higher real-time flows to be considered in lieu of the fixed load design flows (i.e., lowest flows on record), would still not take full advantage of the assimilative capacity of the river. It may be difficult to adjust the system quickly enough to take advantage of changing flows on a monthly basis. There could also be flow constraints downstream that would limit the ability to discharge stored flows under certain conditions. Finally, the real-time approach includes another margin of safety by allowing only 85% of the estimated flow to be used as the real-time design flow.

Taking Water Rights is Not the Solution

On a number of occasions, Regional Board staff has told the TID that their aim in giving a zero allocation to East Side agriculture was to force water use reductions and thereby increase discharges of Sierra source water directly to the San Joaquin River to dilute downstream salt. The BPA Staff Report briefly implies this same concept, saying that "agricultural water conservation could reduce pollutant loading from return flows back to the river potentially making water available for other beneficial uses" (page 37). Using the TMDL process and creating a convoluted, inequitable TMDL to extract Sierra quality water from agriculture on the East Side is not appropriate.

Concerns with TMDL Implementation and Estimated Costs

The BPA Staff Report includes an analysis of alternatives to implement the TMDL, which greatly underestimates the level of effort required to achieve either the fixed load or real-time allocation scenarios. The BPA Staff Report seems to view drainage re-operation as a relatively simple task, which "involves changing the timing of releases to the LSJR to coincide with periods of assimilative capacity by temporarily storing saline drainage" (page 2). However, it is not as simple as that. The BPA Staff Report also includes an estimate of $27 million to $38 million per year for capital and operational costs, which is significant, but may not be anywhere near adequate to cover the real costs.

Although the Regional Board staff has made an effort to analyze measures that may be needed to implement their proposed program, they do not appear to have a firm understanding of the local needs or facilities. The analysis neglects to evaluate the overall costs needed to maintain a salt balance in the region. Without significant infrastructure modifications, the proposed re-operation or rescheduling of releases would result in the concentration of salts in East Side areas. As a result, the analysis contained within the BPA implementation plan is not realistic, is oversimplified, and hugely underestimates the complexity of the solution and its associated costs.

The following comments describe: (1) the current irrigation facilities within the East Side area; (2) why the proposed modifications identified by the Regional Board would not be sufficient to meet the demands of the proposed TMDL in this area; and (3) an example of the types of modifications that would be needed, along with the associated costs.

Irrigation Systems on the East Side

Eastside irrigation districts use gravity fed systems to deliver irrigation supplies to local growers. The irrigation facilities within the TID, for example, include over 250 miles of canals and laterals, 1,600 miles of pipelines and ditches that take water from the canal to the individual parcel, and 15 operational spill points where water spills out of the canal into a downstream waterway. In several cases, these operational spills flow into local drains, where spill water is combined with groundwater seepage, and tailwater return flows from local farms before flowing via gravity to the river.

Gravity fed canal systems. A gravity fed canal system operates in a manner similar to a river system. Once water is in the river, it continues to flow downstream unless it is held behind a dam, diverted or pumped out for other purposes. The same is true with a canal system. Once water is flowing in the canal, it will continue to flow downstream unless it is delivered to an irrigator or otherwise diverted from the canal.

The canal system is designed to be an "upstream controlled system." Canal levels must be held constant within a particular reach of the system to ensure water delivered to irrigators taking water in that location are measurable and consistent. To accomplish this, canal systems are divided into reaches by drop structures. Water upstream of a drop structure is held at a constant level by allowing water to spill slightly over the structure into the downstream reach. In order to ensure the last reach in the system has sufficient water to meet irrigation deliveries, the water spills over the last control drop structure, and out of the canal system. This type of spill is known as an operational spill.

East Side irrigation districts typically use 15 to 20 cfs heads designed to efficiently flood irrigate local crops on sandy soils. A head of water is the rate of flow delivered to an individual grower. Irrigators order water as it is needed for their crops. Based on irrigation orders, surface water is brought into the system, supplemented as needed by groundwater pumping, to meet the irrigation demand. Deliveries to growers are then arranged by canal operators to minimize spills.

In addition, operational spills can result from fluctuations in canal flows as water delivery changes are made. For example, whenever water is transferred from one irrigator to the next some water is lost downstream since it is physically impossible to conduct a simultaneous "hand off" from one irrigator to the next due to the conditions involving time, distance and manual operation. A typical canal will have 20 to 30 of these "hand offs" in a 24 hour period.

Although adjustments in the canal operation are constantly being made to minimize these types of situations, the nature of the gravity irrigation systems will always result in operational spills. Recognizing this, gravity systems are typically designed with a 5-10% operational spill to account for these types of losses.

Water use. The types of crops grown in the East Side area are based on the local economy, as well as local needs. The irrigation systems used are determined by the grower based on their individual needs, crops and soil types. Approximately half the growers in the TID grow tree and vine crops, while the other half produces forage crops such as alfalfa, oats, and corn to support the local dairy industry. While advanced irrigation practices (e.g., drip and micro irrigation) work well on orchards and vineyards, they do not provide an effective means of irrigating forage crops. In addition, flood irrigation provides a practical means of utilizing nutrient water produced by the dairies to fertilize local crops.

It is also important to note that irrigation water is transported from the canal to the farm through over 1,600 miles of pipelines and ditches, many of which were built 50 to 70 years ago. These facilities are typically cast-in-place pipelines or ditches that have been lined. These types of facilities work well to provide for flood irrigation, but will not meet the demands of more advanced irrigation technologies, which require pressurized systems. Any large movement to advanced irrigation systems would require a costly new network of distribution lines from the canal system to individual parcels.

Due to the permanent nature of orchard and vine crops, and the built in market created by the dairy industry for local sources of forage crops, significant changes in irrigation practices or cropping patterns are not anticipated. As a result, the proposed sequential re-use of salty water on more salt tolerant crops is an unlikely alternative in this area.

Need for drainage. On the East Side, there are areas where high groundwater levels require subsurface drainage to maintain agricultural production. Shallow clay layers that impede the downward movement of irrigation water create these perched water or high groundwater conditions. Within the TID, high groundwater areas cover up to half of the TID. Much of these areas are located in the western and southern portions of the TID. Without drainage, high groundwater levels can adversely impact crop production.

Historically the TID has provided a level of drainage through the use of TID owned drainage wells. These wells are utilized to lower shallow groundwater levels and

supplement surface water supplies. Water pumped from drainage wells is discharged into the canal system where it is utilized as much as possible for irrigation purposes and is included in the groundwater pumping portion of the water supply described above.

In more recent years, private tile drains have been installed in some locations. These drains also typically discharge into the canal system, where the water is utilized as much as possible for irrigation supply.

The drainage water pumped into the canal is of a lower quality than the surface water supply. However, the re-use the TID currently practices is a form of the "sequential re-use" proposed by the BPA Staff Report because commingling drainage water in the lower reaches creates progressively more saline supplies. However, due to the nature of a gravity fed system, the TID does not see the "volume reduction" anticipated by the sequential re-use strategy proposed in the BPA Staff Report.

Needed System Modifications for TMDL Implementation

There must be a means of maintaining a salt balance both within the East Side areas and the rest of the river basin. The overall BPA must be developed with a means of ensuring that a salt balance will be maintained.

Within the East Side area, current practices facilitate a means of utilizing groundwater needed for irrigation, providing drainage, as well as transporting salt from the groundwater basin. Significant changes to local infrastructure, operation and management practices will be required in order to comply with the BPA, while continuing to: (1) provide irrigation water for local growers; (2) facilitate drainage needed to maintain agricultural production; and (3) maintain some type of a local salt balance.

The following section provides a discussion of some of the measures that may be needed, as well as the associated costs. The changes would result in a huge burden to the local economy disproportionate to the benefit to the river system realized by these measures.

If implemented, the BPA will require operational spills from the TID and other East Side districts be discontinued entirely, possibly up to 5 months at a time, as needed to meet water quality requirements in the river. Due to the nature and complexity of the existing East Side irrigation facilities (described above), it would be impossible to comply with the proposed BPA on the East Side.

Groundwater drainage. The existing wells used to provide drainage, as well as supplement surface water supplies, discharge salts into the canal system. However to maintain a salt balance, the salts can not continue to be re-circulated and discharged onto local lands without the ability to remove salts from the system. Without the ability to discharge salt to the river and transport it out of the basin, an alternative means of removing drainage water, like a large-scale tile drain system would be needed. Within the TID alone, such a facility will need to cover between 50,000 and 75,000 acres, including a separate transportation, storage, and disposal system.

From the experience of TID, installation costs associated with tile drains vary significantly depending on the spacing of the drain lines, and its proximity to the terminal discharge point. Costs ranged from $200/acre (excluding the sump, pump and

discharge facilities) to $800/acre (for drains located a mile or so from the terminal discharge point). The costs are also higher due to the small parcel sizes in the area, resulting in more infrastructure (e.g. roads, buildings, etc.) that must be avoided when laying out the network of drain lines. The capital cost of installing a system for 50,000 to 75,000 acres could run between $30 to $60 million, not including the on-going operation and maintenance costs associated with such an endeavor.

Control of operational spills. To control operational spills, and compensate for the loss of supply from drainage wells, a recapture and re-use system would need to be designed and constructed to bring the operational spills back into the system. Such a system would likely include canal automation, upstream regulating reservoirs, and pump back systems on the lower reaches of the canals.

An estimate of the cost to install such a system is unknown at this time. However, capital costs could easily run into the tens of millions of dollars, if not more, not including the on-going operation and maintenance costs associated of such a system.

Surface water drainage. There is some surface water drainage, in the form of tailwater flow, that discharges into local drains and is transported via gravity to the river system. As a result, on-farm facility and operational changes would be needed to ensure that tailwater flows are not allowed to leave the field and discharge to local drains. These changes would likely include a combination of tailwater return systems, control structures at the ends of fields, and modifications to irrigation practices.

The number or extent of the systems that would be needed is not known, so it is not possible to estimate the cost at this time. It should be recognized that these costs would be real and would have to be absorbed by the same growers that would also be paying for the costs to implement the other measures identified above.

Overall costs. The overall costs would be significant for the TID area, much less the remainder of the East Side. For example, if the cost for improvements to the TID system totaled $100 to $150 million and was distributed over the entire 147,000 acres, the cost could be $700 to $1,000 per acre. This is a much larger amount than the $25 to $35 per acre estimate indicated in the Economic Analysis in Appendix 4.

Although there are some larger farming operations within the area, East Side parcels are predominately small family farms. For example, within the TID, the average parcel size is only 25-27 acres. The $1,000 per acre in capital costs, plus on-going O&M would be a significant burden for these small family farms.

It is also important to note that this burden is not proportional to the contribution of salt coming from the local area. The East Valley Floor Sub-area contributes only 4% of the overall salt load to the Lower San Joaquin River watershed (Technical TMDL Report, page 1-36). The above estimate includes only the costs that would be expected to implement measures within the TID area, which generates only a portion of the East Valley Floor Sub-area salt load. Therefore, rather than controlling a large percentage of the salts being discharged to the river, these significant, and extremely burdensome measures would be implemented to control an almost insignificant portion (less than 4%) of the overall salt load.

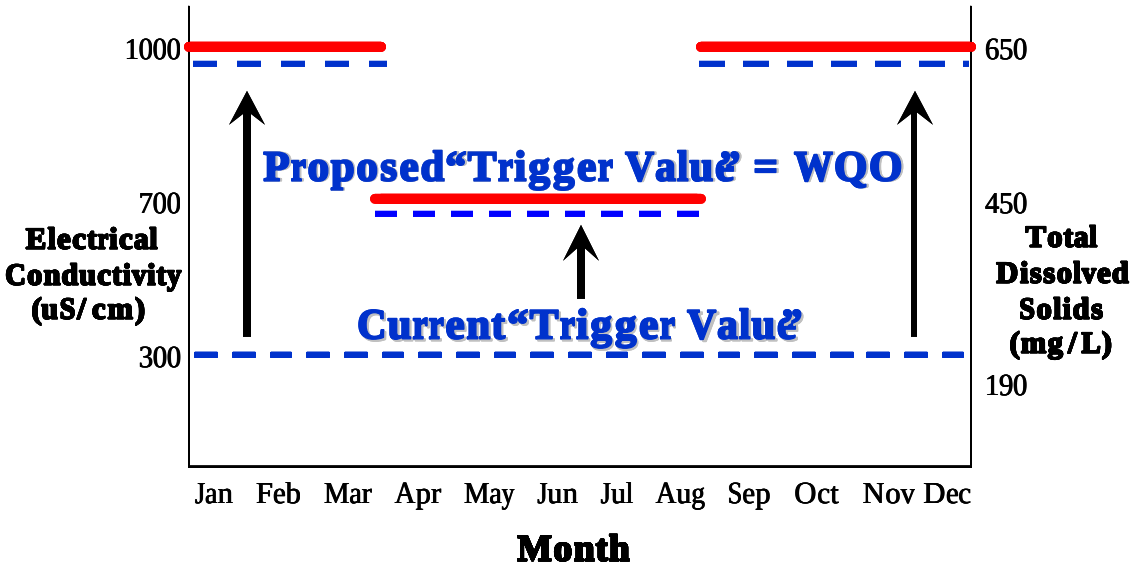
Concentration-based Approach Simpler, More Effective

In their November 2002 written comments, the TID proposed a concentration-based approach to the TMDL, which would greatly simplify the TMDL and would address both aspects of the salinity problem - meeting water quality objectives and transporting salt out of the basin to maintain a long-term salt balance. The proposed concentration-based TMDL would require that all discharges to the San Joaquin River be at or below the water quality objectives for salinity (i.e., 700 or 1,000 EC for the irrigation and non-irrigation seasons respectively).

In the concentration-based approach, the water quality objectives would be applied directly to surface water discharges as a first step in an adaptive management TMDL process. If warranted after implementing this first step, further reductions could be made in the future to offset any persistent higher concentration groundwater discharges. In taking a concentration-based approach, efforts would be focused on the highest concentration sources. The USBR mitigation responsibility could be applied directly to help offset West Side problems with high concentration discharges and the system would not have to be further complicated by the application of credits for lower quality source water.

The concentration-based approach is not very different from the "trigger value" concept in the current version of the TMDL, which allows for all high quality discharges below a given threshold level. The main difference is that the current TMDL has set the threshold level or "trigger value" at 315 EC, which is less than one-half to one-third the water quality objectives. The concentration-based approach, proposed by the TID, would essentially increase the trigger value to be equal to the water quality objectives of 700 and 1000, as shown in Figure 4.

Figure 4. Concentration-based approach similar to trigger value set at WOQs



The TMDL Technical Report briefly describes a basis for the selection of the trigger value (i.e., estimated as a function of salt concentration with a one-time usage, or

"consumptive use allowance"). However, it seems to be a rather arbitrary determination and the value is not linked to meeting in-stream water quality objectives. The concentration-based approach, starting with a discharge limit equal to the water quality objective, would provide a more comprehensive solution to the salinity problem.

A concentration-based approach effectively solves many of the shortcomings of the current version of the TMDL as described below.

Maximizes Salt Export

A concentration-based approach would facilitate much greater export of salt out of the Central Valley, as compared to the fixed load allocation approach. As shown in Figure 4 above, rather than limiting discharges to those with salt concentrations at or below 315 EC, the concentration-based approach would allow discharges up to 700 or 1000 EC, during the summer and winter seasons respectively. Instead of requiring the capture and storage of flows during most of the summer, the concentration-based approach would promote much greater discharge of relatively high quality flows into the San Joaquin River, which would help to dilute downstream salt and to maintain salt transport. The concentration-based approach would avoid the net concentration and build-up of salt that would occur with the fixed load allocation approach. By continuing to transport salts out of the basin, agriculture will be sustainable into the future.

Meets Future Objectives Upstream of Vernalis

If all discharges were required to meet the salinity concentration objectives throughout the TMDL area, then the river would be much more likely to meet objectives at all points in the basin, including those upstream of Vernalis. A concentration-based approach would avoid the need for in-stream blending of high concentration discharges from some areas to meet a downstream point of compliance. Taking a concentration-based approach would address concerns about water quality upstream of Vernalis immediately and avoid the need for a subsequent TMDL process. By improving water quality upstream of Vernalis, source water quality for agriculture on the West Side would also improve over time and lessen the need to treat or otherwise address high concentration discharges from those sub-areas. As source water improves, it is anticipated that the groundwater concentrations on the West Side will also improve, further reducing in-stream salt concentrations.

Provides Greater Equity

A simple concentration-based approach would apply the same standards (e.g., water quality objectives) directly to all dischargers. For those sub-areas with the highest concentration sources, the entity responsible for reducing the quality of source waters would directly participate in offsetting that impact through a mitigation responsibility.

Enables Simple, Direct Measures of Compliance

Compliance with a concentration-based TMDL could be evaluated much more easily. Rather than having to incorporate flow measurements to calculate loads, compliance would be measured directly by salinity concentrations. EC measurements, which are relatively cost-effective to collect, could be evaluated for discharges into the system or at any point within the system to assess compliance.

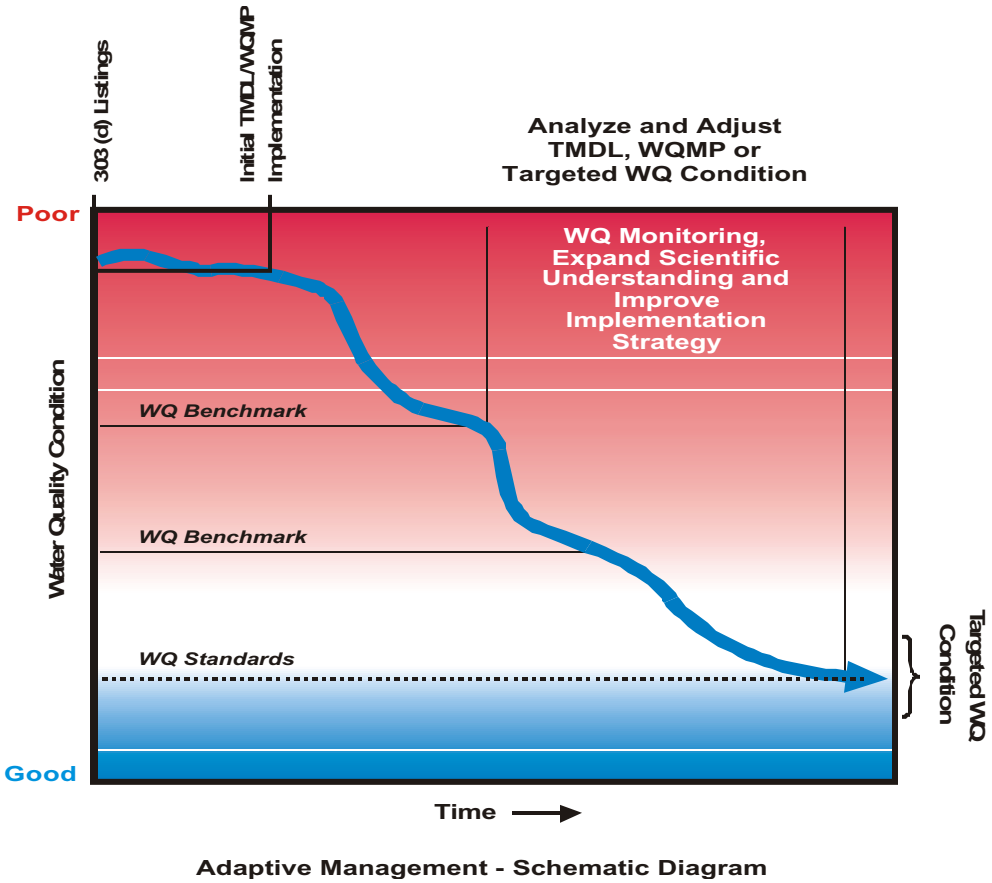
More Cost-effective

Because it is very straightforward, a concentration-based approach would be much less expensive to administer. Rather than diverting critical resources to the TMDL implementation process, efforts could be applied directly to treat the salinity problem. The concentration-based approach would also focus the greatest attention on the highest concentration sources, so that expenditures on control strategies would yield greater net benefits. Focusing on the highest concentration sources also seems to be more in line with the Watershed Policy, referenced above.

Provides a More Appropriate Phased Approach

The concentration-based approach provides great flexibility to adapt and phase in practices to improve water quality as needed over time. The TID has proposed that existing water quality objectives be applied as the initial targets, or first level of implementation for the concentration-based approach. As actions are taken to improve discharge quality to meet the objectives, adaptive management can be applied to monitor system response, refine the analysis, and consider other technologies as needed. As surface water discharges improve, groundwater concentrations are expected to improve as well, helping to reduce salinity concentrations throughout the entire system. If initial actions to reduce salinity in surface water discharges do not fully achieve the instream water quality objectives, then the targets can be reduced or other actions can be taken in an iterative or adaptive process, as depicted in Figure 5. Such adaptive management approaches have been very successfully applied in other significant, multi-party TMDLs (e.g., Snake River/Brownlee Reservoir and Upper Klamath Lake) because they support early progress toward water quality objectives and enable dynamic TMDLs that can effectively respond to complex system changes.

Figure 5. Illustration of Adaptive Management Approach (from Oregon DEQ, 2001)



Concentration-based Approach Warrants Further Consideration

Unfortunately, Regional Board staff has not been receptive to the concentration-based approach to date. After checking the regulations, staff did acknowledge that the concentration-based approach is an allowable means to meet TMDL requirements (Oppenheimer conversation, 2003). The latest version of the TMDL was actually modified to apply the concentration-based approach to point sources. However, Regional Board staff has consistently rejected the TID's proposed concentration-based approach on the basis of two concerns: 1) that the approach would "let East Side agriculture off the hook," and 2) that the concentration-based approach may not meet the water quality objectives. The TID has the following responses to these two concerns.

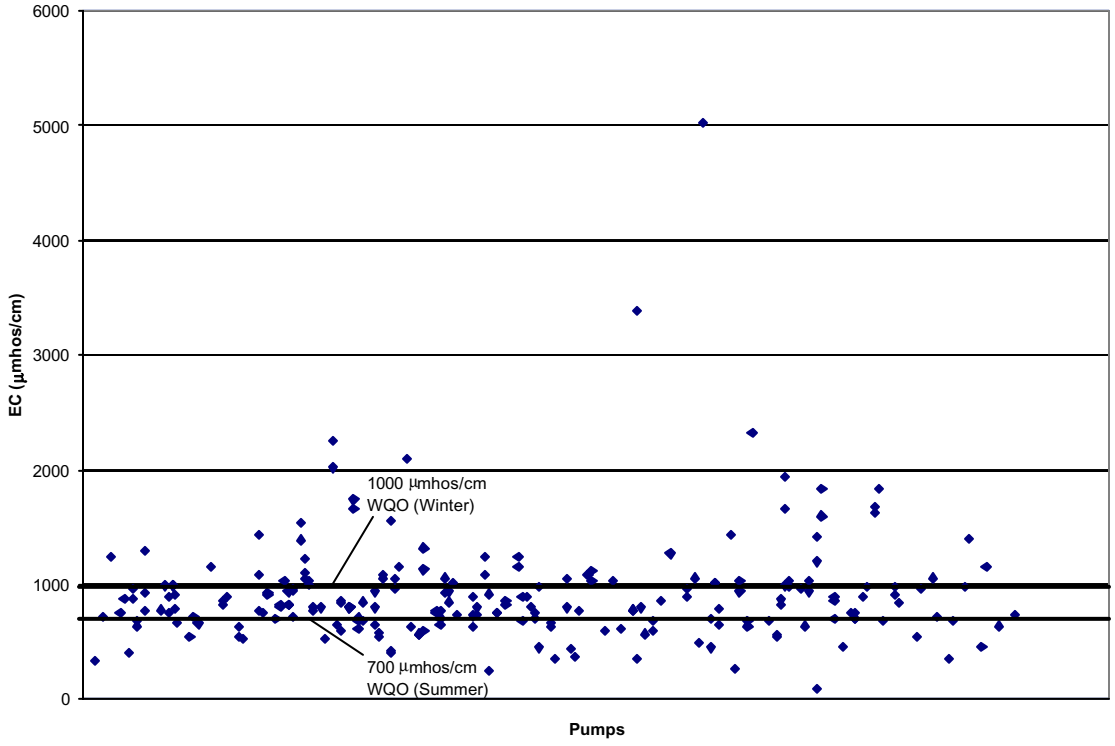
East Side Agriculture Not "Off the Hook"

Although salts are not as much of a concern on the eastern side of the San Joaquin Valley as they are on the western side of the river, there are salt issues that will need to be addressed. Significant modifications will be needed to comply with proposed requirements while continuing to maintain a salt balance.

Groundwater concentrations exceed surface water objectives. As described earlier, East Side irrigation districts utilize a combination of groundwater and surface water for their supply. Groundwater pumped into the irrigation canals, blends with surface water supplies and is distributed to downstream irrigators. Surface water supplies are typically very good quality. However, groundwater can contain much higher salt levels. Groundwater and drainage water pumped into the canal system contain salts that impact the salt concentrations of operational spills discharged from east side areas into the San Joaquin River.

As shown in Figure 6 below, TID water quality analyses of groundwater samples from wells within the TID area have shown salinity concentrations ranging up to 2,000-5,000 EC (data collected in1999 and 2002), especially in the western or southwestern portions of the TID. The higher concentration groundwater in the western area of the TID may actually be coming from the West Side of the river. As noted in the Technical TMDL Report, the USGS found that "groundwater from the west side flows below the LSJR to the east side of the valley" (page 40). Due to high salinity levels, the TID has recently had to cease operation of some wells historically utilized to supplement irrigation supplies.

Figure 6. Salinity levels in groundwater within TID boundaries



The drainage pumping performed over the years within the TID has served the purpose of not only lowering groundwater levels but also removing salts and helping to limit the concentration of salts in the groundwater. Without these pumping and drainage practices, salt concentrations in groundwater would likely have increased to even higher levels over the years.

Surface water return flows exceed trigger value. Salinity concentrations of surface water return flow discharges to rivers from the East Side areas are generally much lower than groundwater concentrations, but can occasionally exceed water quality objectives. As shown in Figures 7 and 8, historic data exhibit concentrations above the objectives on several occasions for the Lateral 6 & 7 spill and at the mouth of the Harding Drain, both of which are located within the TID area. Though concentrations in spills to the San Joaquin River and tributaries are often below the water quality objectives of 700 or 1000 EC, they almost always exceed the trigger value of 315 EC currently proposed in the TMDL. One implication of the fixed load allocation and real-time TMDL would be to prohibit many discharges that are now occurring and effectively diluting higher concentration discharges from other sources. As shown in Figures 6 and 7, spills from Lateral 6 &7 and the Harding Drain would not generally be allowed, when the non-point source allocation is limited, if the lower trigger value were in place. As the data indicate, even with a concentration-based approach, the TID would have to take steps to reduce salinity levels at key locations within their system to ensure consistent compliance with the water quality objectives.

Figure 7. Salinity levels and flow in Harding Drain above outfall to San Joaquin River

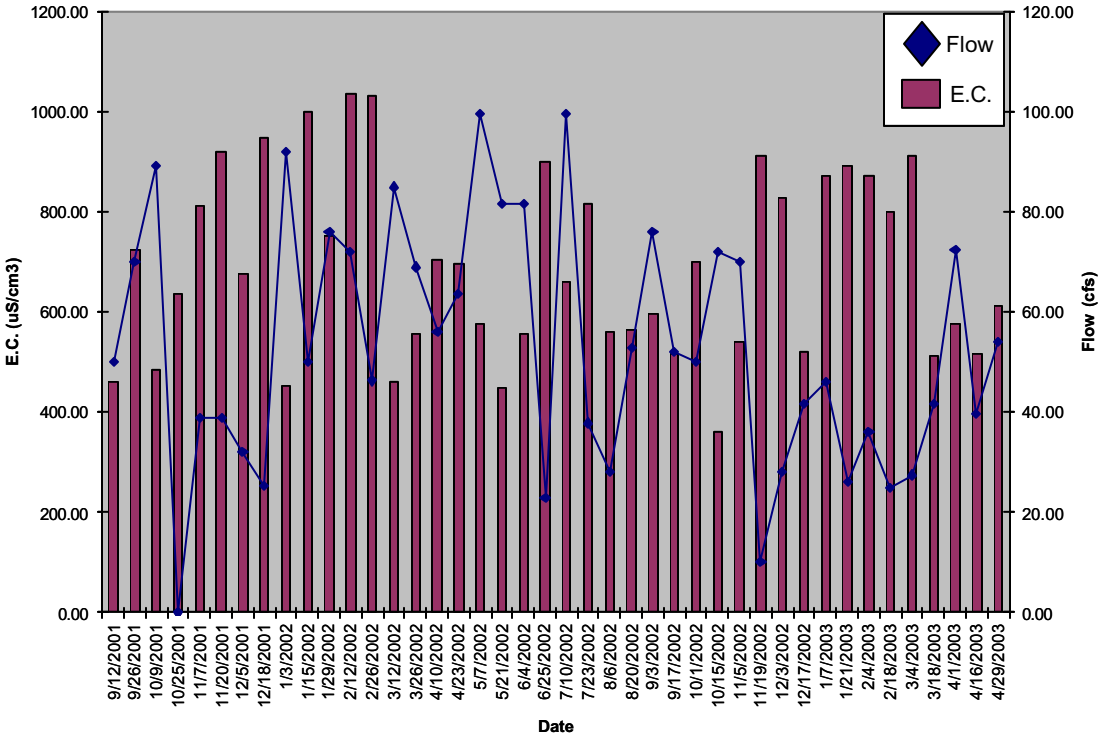
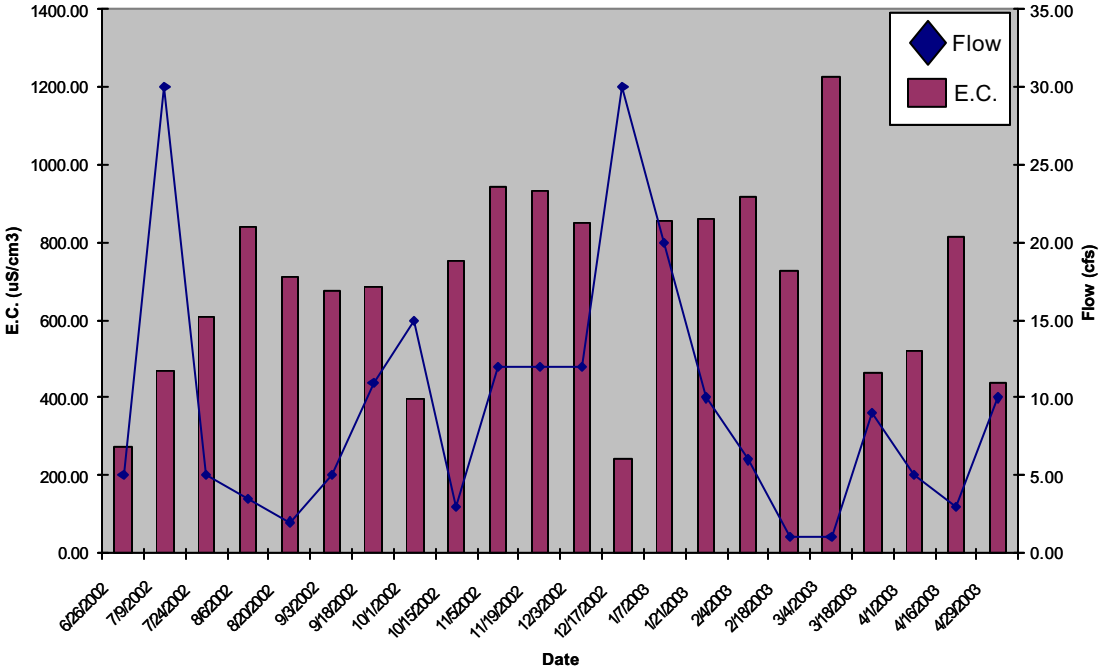


Figure 8. Salinity levels and flow in lateral 6 & 7 spill to the San Joaquin River



Working with growers. The TID has been a leader in working with growers to institute practices that protect water quality. The TID has long recognized that the quality of discharges into its canal system can affect the quality of water being provided to its customers and being discharged to the San Joaquin River and its tributaries. To protect water quality, the TID has established rules to require all discharges to meet pertinent water quality requirements and has established Revocable License Agreements with municipal and other agencies with known discharges to their system.

In addition, the TID has successfully applied for grant funding to support activities to improve water quality. In 2003, the TID was awarded a Proposition 13 grant to identify agricultural discharges within its service area and to develop a program requiring farmers to install positive shut-off devices on tailwater discharges. The TID program has been designed to give the growers the tools (e.g., an understanding of how to operate control structures to reduce flows and improve the quality of field runoff into drains) needed to assist in controlling the quality of agricultural discharges. The grant also contains an educational component to provide information to growers on practices to control tailwater discharges, and it includes some limited monitoring of flow and salinity to evaluate effectiveness of the program.

More recently, the TID has submitted a grant application to CALFED to perform a detailed assessment of the Harding Drain Watershed, which incorporates the largest portion of the TID system, including about 50,000 acres and acting as a significant tributary to the San Joaquin River system. If successful, the TID will work with stakeholders to hire a Watershed Coordinator, establish a Harding Drain Watershed Group, and develop a Watershed Management Plan to address water quality problems

over the long term. As the TID has indicated in the past, the new Agricultural waiver requirements will also require steps to improve the quality of all agricultural non-point source discharges.

Promoting water use efficiency. The TID and other East Side irrigation districts have approved AB 3616 Agricultural Water Management Plans, which promote efficient irrigation practices within their districts in a variety of ways. The AB 3616 process requires agencies to continually review practices to identify additional measures that can be taken to ensure efficient water use.

TMDL objective. It is not appropriate to design a TMDL around a primary aim not to "let East Side agriculture off the hook." A TMDL and its associated implementation plan should start with the end in mind - effectively addressing the salinity water quality problem, and then develop a TMDL that best meets that need (e.g., a concentration-based TMDL). As demonstrated above, the TID is already actively pursuing means to improve water quality within TID.

Concentration-based Approach Can Adapt to Meet Objectives Over Time

The second concern raised by Regional Board staff is that a concentration-based approach would not account sufficiently for high salinity groundwater discharges, which could ultimately cause the San Joaquin River to exceed the salinity objective, even if all surface water discharges were at or below the objective. However, this concern is addressed by a few important factors. First, significant reductions in surface water salinity will also lead to reductions in groundwater salinity over time. Second, if groundwater concentrations have not decreased sufficiently after a period of time, the TMDL can be re-opened and the concentration-based targets can be reduced to offset any persistent adverse impacts of groundwater discharges. The EPA strongly supports such adaptive management approaches, in which initial steps are taken toward improving water quality, monitoring and assessment of the system continues, and additional steps are taken as needed to reach water quality goals over time.

Legal Concerns Raised By Proposed TMDL and Basin Plan Amendment

In addition to the many technical concerns raised by TID, the proposed TMDL and Basin Plan Amendment raise many legal concerns. These issues are detailed below.

Inadequate Consideration of Economic Factors

The Regional Board is required to evaluate, among other things, economic factors. Water Code §§13241 and 13267. Although Appendix 4 to the Staff Report purports to have evaluated the costs to fulfill the requirements of this TMDL, that analysis is seriously flawed. By its own admission, the cost evaluation failed to consider the cost of salt disposal and site closure, (Appendix 4, pages 4-9 – 4-10), and it considered the cost of capturing *mean* flow, rather than *peak* flow (Appendix 4, page 4-5). Additionally, it failed to consider the true, substantial cost of infrastructure that will be required to comply with the TMDL, as detailed earlier in these comments. The report also recognizes these costs may very well be on top of many other control programs in the

process of being implemented by this Regional Board, but does nothing to evaluate the cumulative impacts of all these regulatory programs.

Further, the cost evaluation does not consider the cost impacts on agriculture of reducing groundwater drainage (impacting crop roots), or the agricultural productivity consequences of encouraging salt build up in the soil and groundwater. Neither does it consider the cost to convert established orchards and forage crops to more salt-tolerant plants, nor the consequences on agricultural production of imposing a zero-discharge regimen during the bulk of the growing season. In fact, the staff report admits, "the economic effects of potential changes in agricultural productivity have not been evaluated as part of this analysis" (Appendix 4, page 4-1).

Even where the assumptions made in the staff report are accurate, it does not adequately consider the economic consequences of those costs it concedes will be incurred. Even under the staff report's rosy scenarios, it predicts a 2% increase in the cost of production for growers (Staff Report, page 87). Even a 2% increase in cost of production can be a devastating blow to a farming operation that runs on a small margin. Although profit margin information for growers is hard to find, one study in 1995 showed profit margins for large Farm Labor Contractors in the Fresno area ranged from 1.8% to 3%, with an average profit margin of just 2.4%.[1] Adding 2% in production costs to a farm operating on a 2.4% margin leaves just 0.4% profit. Looked at another way, that 2% in increase in costs would represent over 80% of that farmer's income.

By comparing the cost of compliance to the total cost of agricultural production, rather than to the *profit* available to pay for these compliance costs, the staff report completely glosses over the devastating consequences this TMDL may have on many, many farmers in the region. This could very well be the proverbial "straw that breaks the camel's back" as competition from unregulated agricultural interests abroad increases. The full costs, and their impact on the viability of agricultural interest in the region, should be properly evaluated.

Alternatives Have Not Been Considered

The Regional Board is required to consider reasonable alternatives, and may not approve a proposed activity if there are feasible alternatives that would substantially lessen any significant impact of the proposed action [Pub. Res. Code, § 21002; 23 CCR 3780]. The evaluation in the staff report entirely fails to consider several important alternatives, such as:

- A concentration-based alternative, including allowing non-point source dischargers to discharge at the water quality objective, as point-source dischargers are allowed to do;

- A more equitable allocation of burdens that does not try to balance the salt equation entirely on the East Side while allowing West Side to continue to discharge water that greatly exceeds the water quality objective; and

- Reviewing and modifying the water quality objective itself.

[1] http://are.berkeley.edu/APMP/pubs/sutterpubs/News.6.8.Dec95.html

With regard to this last point, no consideration has been given to performing a Use Attainability Analysis[2] for the current Water Quality Objective. As the recently published draft guidance from the State Board notes:

> While in most cases the existing standards are appropriate and amenable to TMDL development, *in some circumstances, investigation during the development of a TMDL reveals that the standards may be inappropriate* or imprecise, thus rendering water quality attainment impossible through the TMDL process.
>
> * * *
>
> *It would be inappropriate, for instance, to adopt stringent source reduction measures for the ostensible purpose of protecting a beneficial use that natural background levels of pollutants would prevent achieving*, and thus some sort of standards action is the only appropriate regulatory response.
>
> In current practice, there are two types of conditions under which the need for a UAA may arise: (1) when a waterbody is considered impaired (i.e., 303(d) listed) *but the use (and therefore, associated water quality objectives) may not be attainable*, and (2) when considering whether an upgraded or different use from that designated is appropriate. A change of the use is appropriate in either of these conditions.

[State of California S.B. 469 TMDL Guidance, *A Process for Addressing Impaired Waters in California,* Page 6-4 (SWRCB, Draft December 3, 2003)].

The TMDL establishes that the current Water Quality Objective is exceeded by background plus groundwater accretions alone in many instances (e.g., Staff Report, page 32). It seems likely that the Water Quality Objective can *never* be achieved consistently and may be inappropriate. It should be reevaluated before the massive expenditures and potential social dislocation that may result from attempting to implement this TMDL.

Adverse Environmental Consequences have not been Considered and Mitigated

The Regional Board's Basin Planning process is exempt from the specific documentation requirements of CEQA because the Basin Planning process has a functionally equivalent process in place [Public Resources Code §21080.5; 23 CCR §3782]. Thus, CEQA guidance and decisional authority is applicable to the Regional Board's Basin Planning actions.

---

[2] UAAs are "a structured scientific assessment of the factors affecting the attainment of a use which may include physical, chemical, biological, and economic factors…" (40 CFR 131.10(g)). There are four types of situations in which a UAA may be considered: (1) when a waterbody is considered impaired (i.e., 303(d) listed) but the use (and therefore, associated water quality standards) appear to be inappropriate or the use does not exist; (2) when adopting subcategories of a use that require less stringent criteria; (3) when the use does not appear to be attainable; and (4) when meeting the use would likely result in substantial and widespread economic and social impact" (40 CFR 131.10(g)). State of California S.B. 469 TMDL Guidance, *A Process for Addressing Impaired Waters in California*, Page 6-4 (SWRCB, Draft December 3, 2003).

There are numerous instances in the TMDL, Basin Plan Amendment, and Staff Report that raise serious concerns and demonstrate that the Regional Board has not yet complied with its obligations under CEQA. Potential adverse environmental consequences not considered include:

- Increased salinity in the Lower San Joaquin River as a result of prohibiting flows of better quality water from the East Side (Appendix 5, pages A5-19). "The calculation of real-time load allocations did not consider the reduced assimilative capacity associated with removing flow along with the salt in the drainage water.");

- Increased salt concentrations in groundwater (and in river water originating in groundwater) as a result of reduced or eliminated groundwater drainage and as a result of percolation from unlined retention and evaporation ponds (see Appendix 4, page 4-9 – the cost of geomembrane liner was not included, reflecting the TMDL's intent that evaporation ponds be unlined);

- Loss of agricultural land and agricultural production to rising groundwater and increasingly saline irrigation water;

- Recropping to accommodate more saline irrigation waters could result in loss of orchards (a loss of visual esthetics to the community, as well as causing serious economic disruption), and a loss of locally grown forage crops used to supply local dairies;

- Recropping, in turn, could lead to an increase in transportation of feed from outside the area, increasing air pollution at a time when the Central Valley is struggling to reduce its reputation as producing the worst air in the United States, and increasing the cost of production for growers and dairies alike;

- Significant social disruption that will likely result in the removal of land from active agricultural production, increasing the pressure to make the land productive by development instead; and

- Noise, dust, and disruption to local communities while the extensive drainage, capture, impoundment, and treatment systems envisioned by the TMDL are installed.

In addition to failing to consider many potential adverse consequences, the TMDL Environmental Checklist identifies many potentially significant adverse environmental impacts, but fails to recommend further study. In particular, the Checklist identifies several potential impacts to biological resources (Staff Report, pages 99-100), which it describes as "potentially significant" (Staff Report, page 100). Instead of identifying and requiring the implementation of potential mitigation measures, the discussion then suggests that because there are several other stressors acting simultaneously on these same biological resources (including this Regional Board's own selenium TMDL), the cumulative impact of this new stressor can be ignored. In essence, the author is suggesting we simply write-off these endangered-species resources in favor of the greater good of reductions in salinity. This is contrary to CEQA's requirement that all cumulative impacts be evaluated and mitigated. Based on the Checklist's findings, an Environmental Impact Report is required to fully evaluate these potential impacts on biological resources and examine possible mitigation measures.

Other CEQA Violations

The CEQA Environmental Checklist avoids evaluating the environmental impact of the TMDL by saying, "specific projects implemented to comply with the proposed regulations would need to be evaluated by the implementing entity, as necessary (Page 99). Again, in relation to possible impacts on managed wetlands, the Checklist states, "[t]he mix of habitat types within the wetland complexes may need to be changed to reflect changes in the timing of wetland draw down to meet load. Proposed changes to wetland operations or the construction of new facilities would be subject to a separate CEQA analysis by the appropriate lead agency" (Staff Report, page 101). This is classic segmenting or "piecemealing" of a project. "Project" is defined to include the "whole of an action" undertaken, supported or authorized by a public agency with the potential for physical change in the environment "directly or ultimately" [14 CCR. §15378 (a)]. The broad definition of the term "project" is intended to maximize protection of the environment, and CEQA requires that environmental considerations not be concealed by separately focusing on isolated parts and thus overlooking the cumulative effects of the whole action [14 CCR. §15378(a),(c)-(d), *Bozung v. LAFCO*, (1975) 13 Cal.3d 263, 283, 262; *Lexington Hills Assoc. v. State*, (1988) 200 Cal.3d 415]. CEQA prohibits a public agency from dividing a single project into smaller individual sub-projects to avoid responsibility for considering the environmental impact of the project as a whole [*Orinda Assoc. v. Board of Supervisors*, (1986) 182 Cal.3d 1145, 1171].

Additionally, the Regional Board is considering adopting a plan it knows will not work and which will potentially cause adverse environmental and social impacts. The TMDL holds out a promise of a "real-time management plan" that will cure all these ills, but the details of such a plan are completely absent. It is a violation of CEQA to approve a project "subject to" subsequently developed plans and studies [*Oro Fino Gold Mining Corp. v County of El Dorado* (1990) 225 Cal. App. 3d 872, 884-885]. "The CEQA process demands that mitigation measures timely be set forth, that environmental information be complete and relevant, and that environmental decisions be made in an accountable arena."

The TMDL Fails To Meet the Requirements of the Clean Water Act

TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality objectives [Clean Water Act §303(d)(1)(C) and 40 CFR 130.7(c)(1)]. The proposed TMDL acknowledges it will not achieve the Water Quality Objective for salt, and it therefore does not establish "the levels necessary to attain and maintain" the applicable standard.

Unconstitutional Taking of Private Property without Just Compensation

Both the State and the Federal Constitutions prohibit the taking of private property without just compensation. Adopting a TMDL with an ulterior motive of forcing those with rights to higher quality water to discharge that water to dilute the flow of others is an illegal taking. Moreover, there has been no evaluation of the impact on downstream water rights resulting from reduced flows as a result of forced retention of water or the consequential increase in salinity in the Lower San Joaquin River.

Adoption of this TMDL Would be an Arbitrary and Capricious Act

Alternative 4 (Real Time Management, with or without re-operation) is declared the preferred alternative (Appendix 5, page A5-21), yet the TMDL proposes to adopt the Base TMDL (Alternative 3), only allowing for the *possibility* of a real-time management system in the future. Failing to adopt the recommend alternative is arbitrary and capricious.

Furthermore, there is no rational basis for setting the "Trigger Value" at less than one-half the Water Quality Objective during summer months, and about one-third the Water Quality Objective during high-flow winter months, neither of which bears any relationship to meeting the Water Quality Objective. Adopting this "Trigger Value" approach is arbitrary and capricious.

Further, refusing to consider a concentration-based approach to regulate a constituent, the impact of which is concentration-based, is arbitrary and capricious.

This TMDL Violates the Administrative Procedure Act.

The Administrative Procedure Act requires regulations to be clear, consistent, authorized, and necessary [Government Code §11349.1(a)]. With over 445 different TMMLs, not counting the impact of credits, this TMDL fails the APA's tests of clarity. Until the Regional Board conducts a full review of *all* reasonable alternatives, the proposed Basin Plan Amendment will fail the test of necessity.

Conclusions and Recommended Modifications

The TID appreciates the efforts of Regional Board staff in dealing with the very challenging problems of the salinity TMDL. However, the current version is not viable, because it will not meet salinity concentration objectives in the Lower San Joaquin River, nor retain a sustainable salt balance in the Central Valley. It is critical that whatever solution is developed provides a comprehensive means of resolving salt issues in the Central Valley and does not solve one problem (i.e., reducing surface water salt loads and meeting water quality objectives at Vernalis) and create other problems (i.e., net salt build-up in the Central Valley, increasing concentrations in groundwater, and potentially at points upstream of Vernalis).

Concerns with the Current TMDL

The fixed load allocation, which serves as the default TMDL, has several major shortcomings that make it untenable. The real-time allocation does not solve many of these shortcomings and introduces further complications and uncertainty. Key concerns with the existing TMDL are reiterated briefly below.

Limits Salt Export. The fixed load allocation would restrict the ability to export salt from the LSJR basin and would result in a net salt buildup in the watershed and long-term degradation of ground and surface waters (BPA Staff Report pages 2 and 34). In effect,

a fixed load allocation could worsen existing salinity problems and make it even more difficult to reverse high salt concentrations in the future. Though designed to address this flaw, the real-time allocation still will not maximize salt export and will not take full advantage of the available assimilative capacity.

Not an Equitable or Viable Solution. The TMDL applies widely differing concentration endpoints for various categories of dischargers and allows for excessive credits to the West Side sub-areas, while allowing no credits for East Side sub-areas.

Overly Complex and Difficult to Measure Compliance. As demonstrated in the two example calculations, the fixed load allocation is extremely complex and convoluted, to the point that the actual outcomes for water quality are not clear. The 455 TMMLs will be difficult and very costly to administer and it will be nearly impossible to measure compliance. The real-time allocation approach would be considerably more complex and difficult to implement.

Over-Protective. The fixed load TMDL is greatly over-protective, resulting in negative net allocations under some conditions and leaving 10's of thousands of tons/month unallocated, while East Side agriculture is allowed zero allocation under many flow conditions. The real-time allocation would somewhat reduce the margin of safety associated with using the lowest flows on record to calculate TMMLs, but would still retain a 15% safety margin and would not address the issue of unallocated loads.

Produces Adverse Unintended Consequences. The TMDL is a load-based approach to solve a concentration-based problem. Because the TMDL focuses on reducing loads and is not tied to flows and concentrations, it is likely that current allocations will lead to a reduction in overall loads, while increasing concentrations - an adverse unintended consequence that only worsens salinity problems.

Will Not Meet Future Salinity Objectives. As the BPA Staff Report acknowledges, the allocations may "need to be revised to reflect any new or revised water quality objectives" upstream of Vernalis (page 34). In fact, it is highly likely that the TMDL will not meet concentration objectives upstream of Vernalis and that the TMDL will need to be modified substantially.

Legal concerns. There are several legal concerns with the TMDL, including the following.

- Inadequate Consideration of Economic Factor
- Alternatives Have Not Been Considered
- Adverse Environmental Consequences have not been Considered and Mitigated
- Other CEQA Violations
- Unconstitutional Taking of Private Property without Just Compensation
- Arbitrary and Capricious Act
- Violates the Administrative Procedure Act.

Recommended Modifications

TID strongly recommends that the Regional Board re-consider and substantially re-work the TMDL to reflect the comments presented here. Most notably, the TID asks that the

concentration-based approach be given full consideration, that the overly protective allocation be revised (if a fixed load allocation is retained), and that inequities in the credit system be addressed.

Apply concentration-based Approach. The TID encourages the Regional Board to shift from a load-based to a concentration-based TMDL approach. The TID would be happy to work with Regional Board staff to consider the details of how the concentration-based approach might be applied in practice. Overall, the concentration-based approach would provide a simple, sustainable solution to salinity problems in the San Joaquin River Basin. Specifically, a concentration-based approach would overcome shortcomings of the current TMDL and offer several advantages, including the following.

- Maximizes salt export
- Meets future objectives upstream of Vernalis
- Provides greater equity
- Enables simple, direct measures of compliance
- More cost-effective
- Can apply adaptive management to meet objectives over time

Consider re-allocation of the TMDL. Even if the Regional Board is unwilling to consider a concentration-based approach, it should at least re-allocate the unallocated load so that the total allocated loads equal the TMMLs. Given that the West Side is already receiving substantial credits, the re-allocation should go to nonpoint sources on the East Side. The TMMLs already include a sufficient margin of safety in the very conservative flow assumptions and it is inappropriate to add any further margin of safety though unallocated loads.